Division Estimator (WIA and DNBI)

Blue cells are user input areas, yellow cells are formulas and are locked so the user can't change them, green cells are information cells, and cells with red arrows in the corner have a "pop up" help window.

Step 1, enter the security classification. Don't process classified materiel on unclassified computers!

Got a question? Send an e-mail!

Security Classification	Unclassified

Enter the data into the light blue area. Place your cursor over the red triangle for help.
Yellow cells are "output" and those cells are protected.

Division and Below Estimate
Battle Casualty Estimate

Dupuy's Attrition	Code	Description	Data
Population At Risk	N	Enter the troop **population** data	0
Terrain Factor	rc	Casualty rates decrease as the **terrain** becomes more restrictive	1
Weather Factor	hc	Casualty rates decrease as the **weather** becomes more restrictive	1
Posture Factor	uc	Casualty rates decrease for well prepared **defenders** that are able to hold their positions	1
Strength Factor	tz	Casualty rates decrease as the **size** of the unit increases e.g. divisions tend to have a lower rate than infantry platoons	1
Opposition Factor	op	Casualty rates decrease when the **combat effectiveness** of a force increases (when compared to the enemy's effectiveness)	1
Surprise Factor	Su	Casualty rates decrease if a unit is able to avoid being **surprised** by the enemy	1
Sophistication Factor	so	Casualty rates decrease when a unit has **superior equipment** (when compared to the enemy's equipment).	1
Pattern of Operation	PO	Casualty rates tend to DECREASE as the enemy front becomes more disrupted during friendly offensive operations	0.04

Terrain dropdown: Flat, Bare
Weather dropdown: Dry, Sunshine, Temperate
Posture dropdown: Offensive
Strength dropdown: 15000-25000
Opposition dropdown: Even Match — **Calculate Combat Effectiveness** — Even Match
Surprise dropdown: No Surprise
Sophistication dropdown: No Advantage
Pattern dropdown: Disrupted Front

This is the equation that is used to determine the casualty numbers.
Casualties =PO (N x rc x hc x uc x tz x op x Su) x so

Total Battle Casualty Estimate — The casualty data will show up in the yellow area.

Battle Casualty Rate as a percentage of the force		0.00%
KCMIA	15%	0
WIA	85%	0
Total Battle Casualties per day		0

Visualization Tool

Number of Airborne Soldiers		0
Casualty rates increase as **Visibility** decreases		1.25
Casualty rates increase as **Rucksack Weight** increases		1.00
Casualty rates increase as **DZ conditions** worsen		1.00

Visibility dropdown: Night
Rucksack dropdown: Between 50-85 lbs
DZ dropdown: Hard pack

Presentations	0
Admissions	0
Surgeries	0

Sum of Total Battle Casualties per day — 0

Disease & Non-Battle Injury Estimate — Operation Description

Population at Risk		0
DNBI Factor		2.01
Non-Battle Injuries	15%	0
Disease	85%	0
DNBI Casualties per day		0

Operation Description dropdown: Combat Forces in Div A/O high OPTEMPO
Operation Location
Location dropdown: Iraq

Total Casualties Requiring Treatment per day — 0

Unclassified

Step 2, Enter the troop population for your unit. Include everyone operating in your Area of Responsibility.

Step 3, select the appropriate terrain, weather, posture, and strength factor. The strength factor should approximate the population number.

Step 4, push the Calculate Combat Effectiveness Button. Go to next page for instruction on this area.

Step 5, select the appropriate surprise (the enemy surprising you), equipment, and operation pattern. See Annex A for description of operational pattern.

Step 6, select the appropriate percentage for Killed, Captured and Missing in Action.

Step 8, Use the Visualization Tool to look at the credible casualty range that resulted from the WIA estimate.

Step 7, Enter the number of soldiers that parachute into the battle and select the appropriate factor for day or night, Rucksack Weight, and Drop Zone Conditions

Step 9, select the appropriate factors that describe the operation location (i.e. division area) and the geographic location (i.e. South Korea). This determines the Disease & Non-Battle Injury rate.

Step 10, The Total Casualties Requiring Treatment per day is the sum of the Battle Casualties and DNBI casualties.

Combat Effectiveness Calculator

Step 1, Enter the number of battalions that will be involved in the fight by type of unit.

Step 2, Adjust the factors that are provided are for training purposes only, they are derived from CGSC Student Text 100-3. These factors must be updated with operational factors based on the Intelligence Officers assessment of friendly and enemy capabilities.

Step 3, Enter the strength of the units that are involved in the fight.

Step 4, Repeat steps 1,2 & 3 for the enemy forces.

Friendly Forces

Unit Type	# of BNs	Factor	Combat Power	% Strength	Relative Cbt Pwr
M1A1	0	1.19	0.00	100%	0.00
M1A2	2	1.21	2.42	100%	2.42
M2A1	1	1.00	1.00	100%	1.00
M2A2	0	1.00	0.00	100%	0.00
M3A1	0	1.50	0.00	100%	0.00
M3A2	0	1.50	0.00	100%	0.00
Division Cav Sqn	0	2.60	0.00	100%	0.00
Lt. Infantry	1	0.48	0.48	100%	0.48
Airborne Infantry	0	0.73	0.00	100%	0.00
Air Assualt Infantry	0	0.70	0.00	100%	0.00
Div Cav Sqd, Lt	0	0.70	0.00	100%	0.00
Attk Helo (AH-1/OH-58D)	0	2.10	0.00	100%	0.00
Attk Helo (AH-64/OH-58D)	0	4.00	0.00	100%	0.00
M102	0	0.80	0.00	100%	0.00
M119	0	0.80	0.00	100%	0.00
M109A3	0	1.00	0.00	100%	0.00
M109A6	2	1.20	2.40	100%	2.40
M198	0	0.80	0.00	100%	0.00
MLRS	0.25	4.60	1.15	100%	1.15
ATACMS (B-2)	0	7.50	0.00	100%	0.00
ATACMS (B-1)	0	8.80	0.00	100%	0.00
Division ADA	0	0.20	0.00	100%	0.00
Patriot	0	0.59	0.00	100%	0.00
Morale/Training/ Discipline		3			1.00
Defense Factor		1			1.00
Total Friendly			7.45		**7.45**

Enemy Forces

Unit Type	# of BNs	Factor	Combat Power	% Strength	Relative Cbt Pwr
T72	0	0.50	0.00	100%	0.00
T80	1	0.77	0.77	100%	0.77
Indep. Tank (T-80)	0	1.05	0.00	100%	0.00
BMP-1/2	0	0.65	0.00	100%	0.00
BMP-3	3	0.77	2.31	100%	2.31
BTR-50/60	0	0.35	0.00	100%	0.00
BTR-70/80	0	0.60	0.00	100%	0.00
AT BN (BRDM w/AT-5)	0.5	1.00	0.50	100%	0.50
Lt. Infantry	0	0.42	0.00	100%	0.00
Airborne Infantry	0	0.51	0.00	100%	0.00
Air Assualt Infantry	0	0.42	0.00	100%	0.00
Attk Helo (Hokum/Havok)	0	2.70	0.00	100%	0.00
Attk Helo (Hind-E)	0	2.05	0.00	100%	0.00
2S1	0	0.71	0.00	100%	0.00
2S3	0	0.85	0.00	100%	0.00
2S5	2	0.88	1.76	100%	1.76
2S7	0	1.02	0.00	100%	0.00
BM21	1	2.94	2.94	100%	2.94
BM22	0	3.50	0.00	100%	0.00
2A65	0	0.84	0.00	100%	0.00
9P148/2A45M AT	0		0.00	100%	0.00
9A52	0	4.50	0.00	100%	0.00
ZU23/SA18	0	0.76	0.00	100%	0.00
Morale/Training/ Discipline		3.00			1.00
Defense Factor		1			1.00
Total Enemy			8.28		**8.28**

0.90 Select this factor on the estimator.

Even Match

[Return to Estimator]

Enter the number of friendly and enemy units that will be involved in the operation. The Combat Power Factor is from Command and General Staff College Student Text 100-3. The Combat Power factor can be changed to reflect different equipment (Check with the Intel Officer!).

Step 5, Examine the ratio of friendly to enemy forces. Push the "Return to Estimator" button to return to the estimator.

Patient Flow Worksheet

Casualty Flow	
Total number of Division patients requiring treatment	105
Total number of Corps patients requiring treatment	0
Total number of EAC patients requiring treatment	0
Total number of patients requiring treatment	**105**

Patient Flow			
Level 1 Arrivals	105	**Default Values**	
Level 1 RTD DNBI	3	10.00%	of DNBI
Level 1 RTD WIA	10	15.00%	of WIA
Level 1 Evacuated to Level 2	92		
Level 2 RTD DNBI	29	85.00%	of remaining DNBI
Level 2 RTD WIA	12	20.00%	of WIA
Level 2 FST cases	9	15.00%	of WIA
Level 2 Evacuated to Level 3	51		
Corps Level 2 Treated	0		
Corps Level 2 RTD DNBI	0	85.00%	of remaining DNBI
Corps Level 2 RTD WIA	0	25.00%	
Corps Level 2 Evac. To Level 3	0		
Level 3 Admissions	51		
Level 3 RTD DNBI	2	45.00%	of remaining DNBI
Level 3 RTD WIA	5	10.00%	
Level 3 Surgical cases	23	50.00%	of WIA
Level 3 Evacuated to Level 4	44		
EAC Level 2 Treated	0		
EAC Level 2 RTD DNBI	0	80.00%	of remaining DNBI
EAC Level 3 RTD WIA	0	0.00%	
EAC Level 2 Evac. To Level 4	0		
Level 4 Admissions	44		
Level 4 RTD	0	45.00%	of remaining DNBI
Level 4 RTD WIA	0	0.00%	
Level 4 Surgical cases	0	80.00%	of WIA
Level 4 Evacuated	44		

Step 1, Adjust the RTD values at level 1, 2 and 3 as a result of the mission analysis.

Battalion Aid Station Workload Estim

Step 1, Enter the duration of the operation. This should be the length of time that soldiers are at risk of becoming WIA casualties as a result of being in the "red zone" fight.

Step 2, Select where the expected peak casualty arrival will occur; early (Airborne mission), middle (Movement to Contact), or late (Deliberate Attack).

Step 3, (Must enter at least "1" in each area!)
   a. Enter the distance that the evacuation vehicles will have to travel in Kilometers.
   b. Enter the number of evacuation vehicles, by type, the average number of patients and the average speed of the vehicle. Account for the time required to load and unload patients when determining the average speed.

Duration of Mission (Hours)	10	Recommend a minimum of 10 hours

	Urgent	Priority	Routine
Casualty Distribution	30%	40%	30%

Workload Factors Echelon 1 (BAS)   **Minimum Required**

Workload Factors Echelon 1 (BAS)		Minimum Required
Point Of Injury to Echelon 1	311	
Ground Distance from CCP to BAS **km**	10	
Air Distance from CCP to BAS **km**	1	
Number of Ground Ambulances	15	10
Number of patients per ambulance	3	
Ground Ambulance Speed **km/hr**	20	
Number of Nonstandard Ground Vehicles	1	0
Number of patients per vehicle	1	
Nonstandard Vehicle Speed **km/hr**	1	
Number of Air Ambulances	1	0
Number of patients per ambulance	1	
Air Ambulance Speed **km/hr**	1	
Number of Nonstandard Aircraft	1	0
Number of patients per aircraft	1	
Aircraft Speed **km/hr**	1	
Percentage of Patients to go by Ground Amb.	100.00%	
Percentage of Patients to go by NS Ground	0.00%	
Percentage of Patients to go by Air Amb.	0.00%	
Percentage of Patients to go by NS Air	0.00%	100.00% #Round Trips
Time required for Ground Amb. Patient Evac **hrs**	6.91	7
Time required for NS ground Patient Evac **hrs**	0.00	0
Time required for Air Amb. Patients Evac **hrs**	0.00	0
Time required for NS air Patients Evac **hrs**	0.00	0

Expected Peak Arrival of Casualties
- ◯ Early in the Mission
- ◉ In the Middle of the Mission
- ◯ Late in the Mission

Number of Casualties POI to BAS
The Line Shows Max. Evac. Per Time Period

Legend: Urgent ▮ Priority ▮ Routine ▯ Patient/Time Period ◆
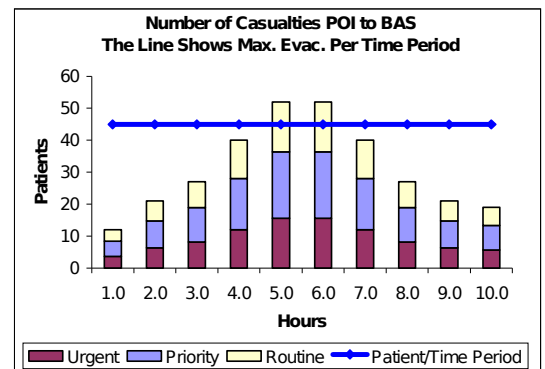
Step 4, Select the percentage of patients to be transported by each method. The total must add up to 100%. If there is a method that will not be used, i.e. air ambulance, then enter 0%.

Step 5, Examine the minimum evacuation duration. This is the minimum time required to move the casualties if they all showed up at the same time. The user should adjust the evacuation percentage to order to reduce the required time as much as possible.

Step 6, Look at the number of round trips necessary to evacuate the casualties. Determine if this number of round trips is feasible (escorts required and available?)

Step 7, Use this chart to determine if there any evacuation shortfalls. The blue line is the maximum evacuation capability and the bars are the number of casualties per time period. If the bars are above the line, casualties exceed evacuation requirements.

Medical Company Workload Estimator

Workload Factors Echelon 2 (FSMC/BDE Surgeon)		Unclass
Number of Patients Requiring Evacuation	278	Minimum Requir
Ground Distance from BAS to AXP **km**	10	
Ground Distance from AXP to FSMC **km**	25	
Ground Distance from BAS to FSMC **km**	35	
Air Distance from BAS to FSMC **km**	35	
Number of Track Ambulances	6	5
Number of patients per ambulance	3	
Track Ambulance Speed **km/hr**	20	
Number of Ground Ambulances	4	7
Number of patients per ambulance	3	
Ground Ambulance Speed **km/hr**	35	
Number of Nonstandard Ground Vehicles	1	0
Number of patients per vehicle	1	
Nonstandard Vehicle Speed **km/hr**	1	
Number of Air Ambulances	2	2
Number of patients per ambulance	5	
Air Ambulance Speed **km/hr**	120	
Number of Nonstandard Aircraft	1	0
Number of patients per aircraft	1	
Aircraft Speed **km/hr**	1	
Percentage of Patients to go by Ground Amb.	50.00%	
Percentage of Patients to go by NS Ground	0.00%	
Percentage of Patients to go by Air Amb.	50.00%	
Percentage of Patients to go by NS Air	0.00%	100.00%
Time required for Track Amb. Patient Evac **hrs**	7.72	
Time required for Ground Amb. Patient Evac **hrs**	16.55	# Round Trips
Time required BAS to FSMC **hrs**	17.05	12
Time required for NS ground Patient Evac **hrs**	0.00	0
Time required for Air Amb. Patients Evac **hrs**	8.11	14
Time required for NS air Patients Evac **hrs**	0.00	0

Number of Casualties BAS to FSMC
The Line Shows Max. Evac. Per Time Period

Number of FSTs available	1	
FST time per procedure	2.4	hrs/patient
FST Surg. Capability 12 hrs/FST/day	12	hrs total capability
FST Capability **pts per day**	**10**	Patients
FST Required **pts per day**	**12**	Patients
FST Workload Difference	**-2**	Patients
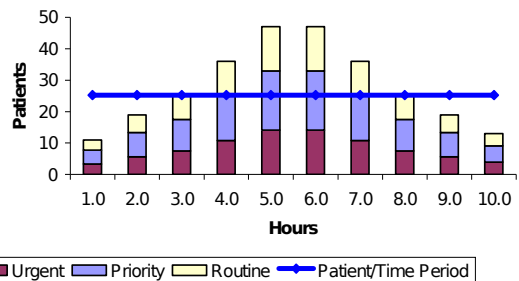
Number of FST Patients Per Hour

1

Number of Potential FST Patients
The Line Shows Max. Patent Per Time Period
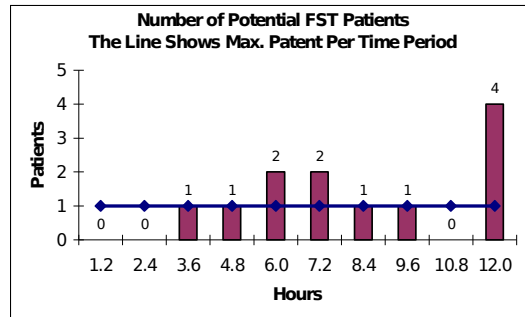
Unclassified

Combat Support Hospital Workload Es

Step 1, (Must enter at least one in each area!)
    a. Enter the distance that the evacuation vehicles will have to travel in Kilometers.
    b. Enter the number of evacuation vehicles, by type, the average number of patients and the average speed of the vehicle. Account for the time required to load and unload patients when determining the average speed.
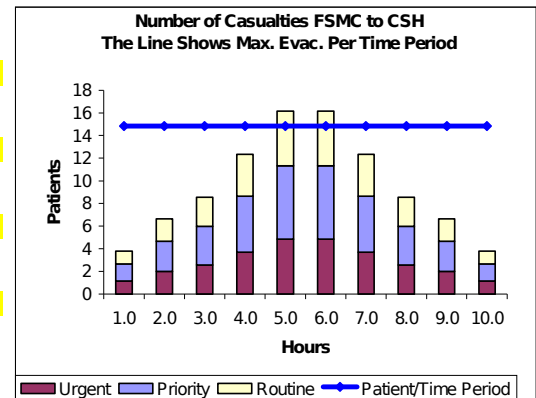
Unclassified

Workload Factors Echelon 3 (MedGroup & Div / Corps Surgeon)

Number of Patients Requiring Evacuation	95	Minimum Required
Ground Distance from FSMC to CSH **km**	120	
Air Distance from FSMC to CSH **km**	120	
Number of Ground Ambulances	10	4
Number of patients per ambulance	4	
Ground Ambulance Speed **km/hr**	35	
Number of Nonstandard Ground Vehicles	1	0
Number of patients per vehicle	1	
Nonstandard Vehicle Speed **km/hr**	1	
Number of Air Ambulances	2	2
Number of patients per ambulance	6	
Air Ambulance Speed **km/hr**	180	
Number of Nonstandard Aircraft	1	0
Number of patients per aircraft	1	
Aircraft Speed **km/hr**	1	
Percentage of Patients to go by Ground Amb.	25.00%	
Percentage of Patients to go by NS Ground	0.00%	
Percentage of Patients to go by Air Amb.	75.00%	
Percentage of Patients to go by NS Air	0.00%	100.00% # Round Trips
Time required for FSMC Ground Amb. Patient Evac **hrs**	4.07	1
Time required for FSMC NS ground Patient Evac **hrs**	0.00	0
Time required for FSMC Air Amb. Patients Evac **hrs**	7.92	6
Time required for FSMC NS air Patients Evac **hrs**	0.00	0

Number of Casualties FSMC to CSH
The Line Shows Max. Evac. Per Time Period

Legend: Urgent | Priority | Routine | Patient/Time Period

Unclassified

Step 2, Select the percentage of patients to be transported by each method. The total must add up to 100%. If there is a method that will not be used, i.e. air ambulance, then enter

Step 3, Examine the minimum evacuation duration. This is the minimum time required to move the casualties if they all showed up at the same time. The user should adjust the evacuation percentage to order to reduce the required time as much

Step 4, Look at the number of round trips necessary to evacuate the casualties. Determine if this number of round trips is feasible (escorts required and available?)

Medical Supply (Class VIII) Estimat

Step 1, Enter the number of patients that can be treated using one Trauma Treatment Set, Sick Call Set, and/or Forward Surgical Team Set. The more patients that can be treated per set, the less resupply that will be required.

Number of Patients Treated per Trauma Treatment Medical Equipment Set	40
Number of Patients Treated per Sick Call Medical Equipment Set	40
Number of Patients Treated per Forward Surgical Team Set	30

Unit	WIA/NBI pts			lbs of Class VIII	MRS Trauma Treatment	
Division Echelon I	172	11	lbs/pt	1883	4.30	
Division Echelon II	172	11	lbs/pt	1883	4.30	
Corps Echelon II	0	11	lbs/pt	0	0.00	
EAC Echelon II	0	11	lbs/pt	0	0.00	
					8.60	

Unit	Disease pts			lbs of Class VIII	MRS Sick Call	
Division Echelon I	8	5	lbs/pt	38	0.20	
Division Echelon II	7	5	lbs/pt	33	0.18	
Corps Echelon II	0	5	lbs/pt	0	0.00	
EAC Echelon II	0	5	lbs/pt	0	0.00	
					0.38	

Unit	WIA/NBI pts			lbs of Class VIII	
FST, Div. Level	26	73	lbs/pt	1898	

FST/Ech II Blood	WIA/NBI pts			Units of		Blood Group	Units Required
Red Blood Cells	172	47.70	units/cpt		82	O+	70
						O-	12

Total Weight (st)	
0.96	Division Echelon I
0.96	Division Echelon II
0.95	FST
0.00	Corps Echelon II
0.00	EAC Echelon II
0.08	Blood, Ice, Administration Sets & Insulated Shipping Container
2.95	Total Weight (st)

Step 2, Enter the units of blood per patient that will be required. A study conducted by the International Committee of the Red Cross recommends 47.7 units per one hundred patients for casualties treated by a surgical team. This study was published in the British Journal of Anesthesia, 1992; 68: 221-223.

Step 3, The total short tons of class VIII required to support this patient load is provided in this area.

Patient Accumulation Worksheet

This worksheet is an attempt to show the impact of various lengths of stay on ho

Step 1, Enter the average length of stay for patients. This factor should take into account the evacuation policy and the evacuation delay. It is usually between 3 and 5 days.

									Unclassified
3	< Enter the number of days for the Evacuation Delay here.								
	Admissions	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Day 1	0	0	0	0	0	0	0	0	0
Day 2	0		0	0	0	0	0	0	0
Day 3	0			0	0	0	0	0	0
Day 4	0				0	0	0	0	0
Day 5	0					0	0	0	0
Day 6	0						0	0	0
Day 7	0							0	0
Day 8	0								0
Day 9	0								
Day 10	0								
Day 11	0								
Day 12	0								
Day 13	0								
Day 14	0								
	Daily Census	0	0	0	0	0	0	0	0
	Hospital Capacity	3	3	3	3	3	3	3	3

Step 2, Manually input other days admissions. These should be done on separate Workbooks. The daily census numbers reflect the total bed requirement over time. The hospital capacity numbers come from the Workload Worksheet.